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New records, range extensions and updated distribution of two gymnophthalmid lizards from the Caribbean Region, Colombia

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Abstract: In Colombia, detailed knowledge of the geographic distribution of gymnophthalmid lizards is scarce. This paper presents the first confirmed records of *Leposoma rugiceps* and provides additional records of *Gymnophthalmus speciosus* from Department of La Guajira, in the Colombian Caribbean Region. These records extend the geographical distribution of both species and support their wide distribution in the lowlands of north of Colombia. Furthermore, we provide an updated distribution map with known occurrences of these species in Colombia.

Key words: *Leposoma rugiceps*, *Gymnophthalmus speciosus*, gymnophthalmid lizards, geographic distribution, Caribbean Region

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The family Gymnophthalmidae includes approximately 232 species of small to medium-sized lizards, which inhabit most of the habitats from Central to South America (Pellegrino et al. 2001; Castoe et al. 2004; Vitt and Caldwell 2009). In Colombia, there are currently 72 species of gymnophthalmid lizards; six belong to the genus *Leposoma* Spix, 1825 and one to the genus *Gymnophthalmus* Merrem, 1820 following the taxonomic proposal of Uetz and Hošek (2015). Although several research projects have increased the knowledge on the diversity of lizards in Colombia (e.g., Castro-Herrera and Vargas-Salinas 2008; Llano-Mejía et al. 2010; Cardona-Botero et al. 2013; Carvajal-Cogollo et al. 2013; Pedroza-Banda et al. 2014), information of the geographic distribution of gymnophthalmid lizards is still incipient because of two main factors: firstly, many gymnophthalmid species have fossorial or semi-fossorial live styles, complicating their collection in the field; and secondly, inventories of lizard fauna in several areas of Colombia are scarce, thus, extensive field research is still required (Arbeláez-Cortés 2013).

La Guajira is the northernmost peninsula of South America, both in northeastern Colombia and northwestern Venezuela. In Colombia, most of La Guajira Peninsula correspond to Department of La Guajira in the Caribbean Region. It is characterized by a high diversity of ecosystems that are unique to the country (Corpoguajira 2011); however, this region has been explored only superficially and, as a result, its lizard fauna is poorly known. Several field surveys were conducted between November 2011 and August 2012, in an effort to increase the current knowledge of the biodiversity of La Guajira. As a result from these expeditions, hereby we report the first record of *Leposoma rugiceps* (Cope, 1868) and provide new records of *Gymnophthalmus speciosus* (Hallowell, 1861) from Department of La Guajira (Colombia). We identified the specimens based on the descriptions and taxonomic keys available in the literature (Hallowell 1861; Cope 1868; Burt and Burt 1931; Ruibal 1952; Peters and Barros-Donoso 1970; Hernández-Ruz 2006). Collection permits were granted by the regional environmental authority of the Department of La Guajira (Corporación Autónoma Regional de La Guajira, Acuerdo 0021-2011). Voucher specimens were deposited in the Colección Herpetológica of Universidad Industrial de Santander (UIS), Bucaramanga, Colombia (UIS-R–2767 to 2772).

We mapped the geographical distribution of *L. rugiceps* and *G. speciosus* based on relevant literature (see below) and records deposited in: Colección Herpetológica of Universidad Industrial de Santander, Colombia (UIS); the virtual catalogues of the Instituto de Ciencias Naturales of Universidad Nacional de Colombia (ICN); Museo de Herpetología of Universidad de Antioquia, Colombia (MHUA) and the Museum of Zoology of the University of Michigan (UMMZ). We obtained additional data from other institutions through HerpNET (http://www.herpnet.org) and SiB Colombia (http://www.sibcolombia.net) on 3 September 2014. Records containing uncertain or inconsistent geographic information were excluded from the maps.

Figure 1–4. Habitats of specimens of *Leposoma rugiceps* from Department of La Guajira (Colombia) reported here. **1:** Adult male of *Leposoma rugiceps* (UIS-R–2767). **2:** Coastal vegetation in the lower Rincón Mosquito River valley, corregimiento of Mingueo, municipality of Dibulla. **3:** Riverine native pastures in the lower San Salvador River valley, corregimiento of Palomino, municipality of Dibulla. **4:** Riparian vegetation in the middle Tomarrazón River valley, corregimiento of Tomarrazón, municipality of Riohacha.

Collection acronyms followed Sabaj-Pérez (2014).

Leposoma rugiceps (Figure 1) is a small gymnophthalmid lizard known from several localities in Colombia and Panama (Köhler 2008; Pellegrino et al. 2011; Lotzkat et al. 2012). In Colombia, the species has been recorded in the lowlands (<510 m above sea level [a.s.l.]) of Pacific, Caribbean, and Andean Regions; departments of Chocó, Caldas, Antioquia, Córdoba, Sucre, Atlántico, Magdalena, Cesar, Santander, Cundinamarca, Boyacá, and Meta (Ayala et al. 1986; Sánchez et al. 1995; Dueñez-Gómez et al. 2004; Gutierrez and Arredondo 2007; Moreno-Arias et al. 2008; Arredondo 2010; Medina-Rangel 2011; Lotzkat et al. 2012; ICN; MHUA; UIS; UMMZ). The species has also been reported from Tolima, Arauca, Casanare, and Vichada (Ávila-Pires 2005; Llano-Mejía et al. 2010); however, these records need to be corroborated because the authors do not mention any voucher specimens or herpetological collections for reference. The record from the Department of Bolivar, deposited in the ICN (catalog number 5464) and mentioned in Ayala et al. (1986), is inaccurate because data written on the specimen's label and geographic coordinates correspond to Department of Sucre, Colombia. The specimens reported herein (UIS-R–2767 to 2770) come from the municipality of Riohacha, corregimiento of Tomarrazón (11°08′38″ N, 072°53′59″ W, 135 m a.s.l.) and the municipality of Dibulla, corregimiento of Mingueo (11°15′5″ N, 073°26′3″ W, 11 m a.s.l.) and Palomino (11°12′21″ N, 073°31′43″ W, 21 m a.s.l.). These are the first records of the species from the Department of La Guajira. During the field surveys, we collected four specimens and observed others on the localities above mentioned. The specimens were found in the leaf litter within riparian vegetation, riverine native pastures, and coastal vegetation (Figures 2–4). The most eastern record in the Department of La Guajira (corregimiento of Tomarrazón) is located ca. 110 km east, relative to the previously known nearest point in Mendiguana River (Department of Magdalena, Colombia). In addition, we found a communal egg laying of six eggs in pairs, at near the same stage of embryonic

development. The distribution of *L. rugiceps* in Colombia is summarized in Figure 5.

Gymnophthalmus speciosus (Figure 6) is a small-sized gymnophthalmid lizard distributed from southern Mexico to Venezuela, as well as the Chacachacare Island in Trinidad and Tobago (Cole 1990; Hernández-Ruz 2006; Köhler 2008; Infante-Rivero 2009; García-Roa and Sunyer 2012). This species represents a cryptic species complex of lineages that are morphologically indistinguishable but genetically diverse (Cole et al.

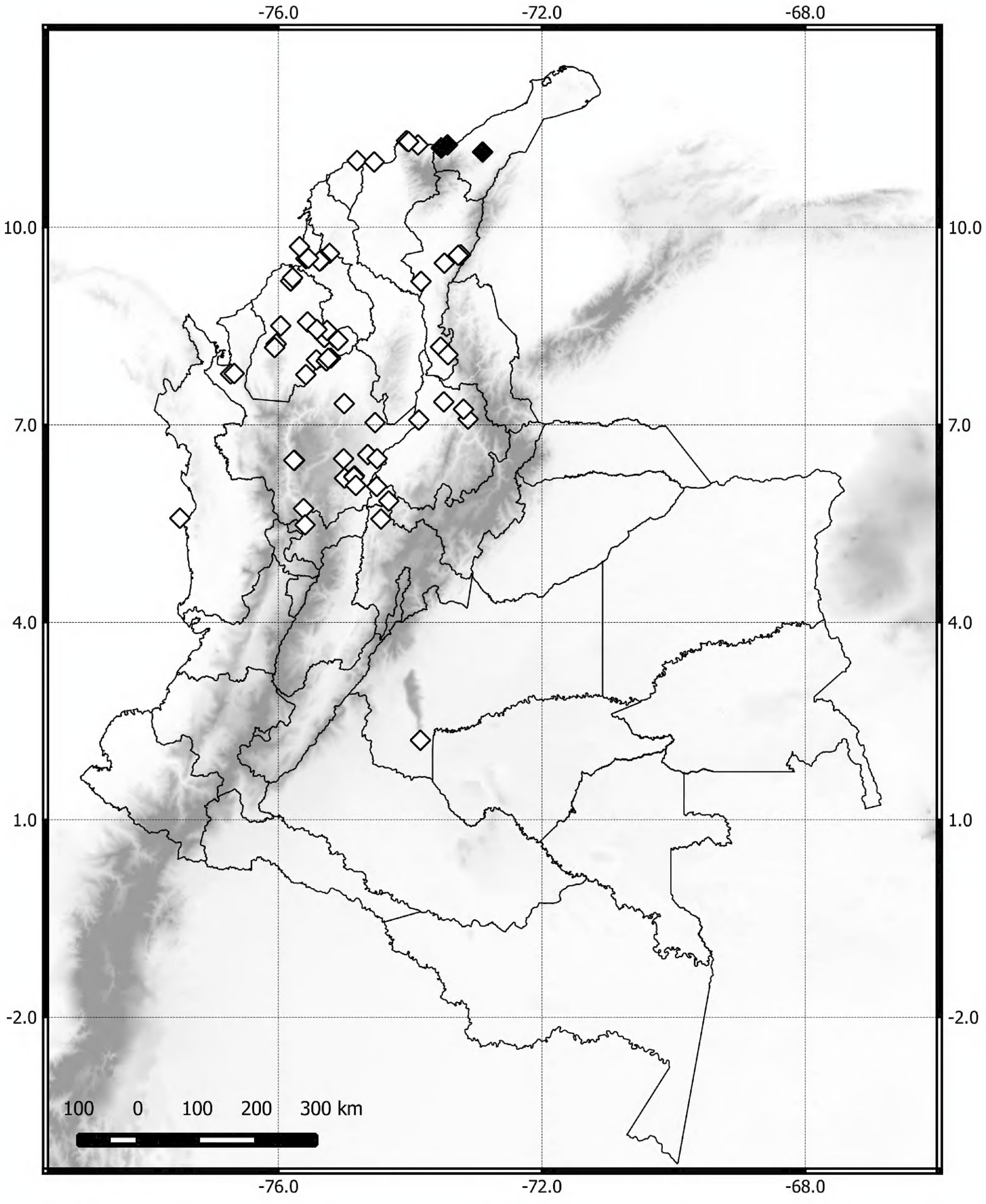

Figure 5. Distribution map with confirmed records of *Leposoma rugiceps* in Colombia. Black diamonds indicate new records presented here. The datum used for geographic coordinates is WGS84.

Figure 6–9. Habitats of specimens of *Gymnophthalmus speciosus* from Department of La Guajira (Colombia) reported here. **6:** Adult male specimen of *Gymnophthalmus speciosus* (UIS-R–2771). **7–8:** Forest vegetation at middle Ranchería River valley, locality Ojo Caro, municipality of Hato Nuevo. **9:** Riverine native pastures in the middle Cañaverales River valley, corregimiento of Corralejas, municipality of San Juan del Cesar.

1990; Hoogmoed et al. 1992; Kizirian and Cole 1999). In Colombia, the species has been reported in the lowlands (<900 m a.s.l) of Caribbean and Orinoquía regions, departments of Antioquia, Córdoba, Sucre, Atlántico, Magdalena, La Guajira, Cesar, Cundinamarca, Norte de Santander, Casanare, Vichada, Meta, Tolima, Valle del Cauca, and Amazonas (Ayala et al. 1986; Sánchez et al. 1995; Hernández-Ruz 2006; Castro-Herrera and Vargas-Salinas 2008; Armesto et al. 2011; Medina-Rangel 2011; Carvajal-Cogollo et al. 2013; Pedroza-Banda et al. 2014; ICN; MHUA; USNM; UMMZ; UVC). Furthermore, the species was included in the list of reptiles of the protected area Reserva Forestal Protectora Montes de Oca (Department of La Guajira) by Galvis-Peñuela et al. (2011); nonetheless, this record needs to be confirmed because the authors did not provide information about the voucher specimens or herpetological collection where they were deposited. Recently, Blanco-Torres et al. (2013) recorded the species in the middle valley of the Ranchería River (Carbones del Cerrejón Ltd., municipality of Albania), which represents the first confirmed record from Department of La Guajira (Colombia). The specimens reported here (UIS-R–2771 and 2772) extent the geographic distribution to municipality of San Juan del Cesar, corregimiento of Corralejas (10°43′51″ N, 072°51′3″ W, 265 m a.s.l) and municipality of Hato Nuevo, locality Ojo Caro (11°08′32″ N, 072°41′21″ W, 306 m a.s.l) in the Department of La Guajira. The specimens were found under decaying plant debris (near 30 cm of depth) within forest vegetation and riverine native pastures (Figure 7–9). The record from corregimiento of Corralejas (municipality of San Juan del Cesar) is located ca. 60 km southwest from Carbones del Cerrejón Ltd. (Blanco-Torres et al. 2013), whereas the record from locality Ojo Caro (municipality of Hato Nuevo) is about 17 km east from the aforementioned locality. The distribution of *G. speciosus* in Colombia is summarized in Figure 10.

Our results represent the most detailed and updated distribution of *L. rugiceps* and *G. speciosus* in Colombia. The new records provided here support the wide distribution of these species in the lowlands of the Colombian

Caribbean Region. As well as in La Guajira Colombiana, it is possible that *L. rugiceps* also occurs in part of La Guajira Venezolana adjacent to the documented range. Hence, new expeditions, particularly to unexplored areas of Colombia, will offer a more detailed picture of the biogeographical distribution of these lizards and help us understand their role in these ecosystems. The fact that both species can be found in human-modified habitats suggests that these species might be able to survive in highly modified environments as long as

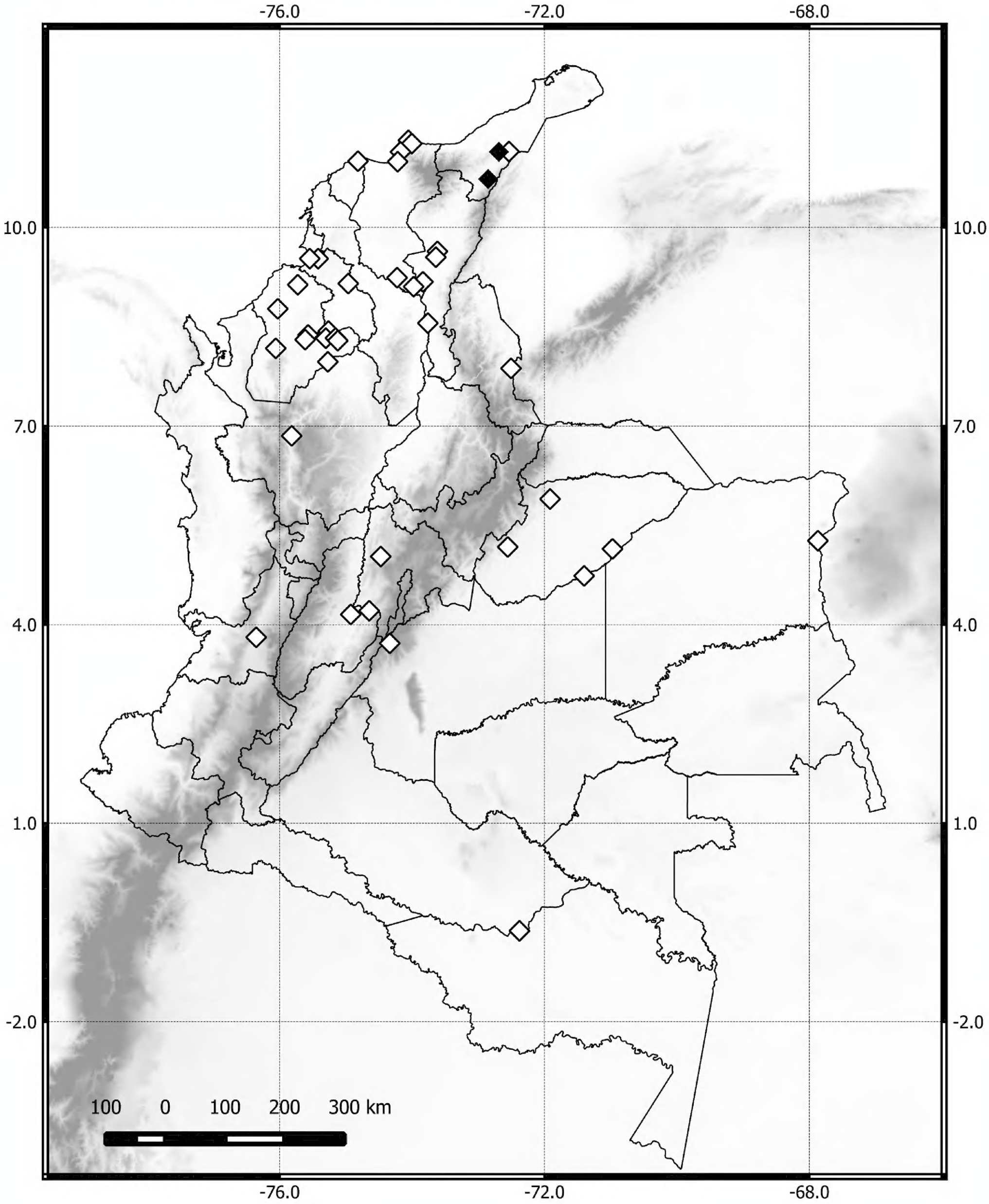

Figure 10. Distribution map with confirmed records of *Gymnophthalmus speciosus* in Colombia. Black diamonds indicate new records presented here. The datum used for geographic coordinates is WGS84.

there are suitable microhabitats; thus, research on the natural history of gymnophthalmid species will not only improve our knowledge of these organisms but will also shed light on the effects of anthropogenic modifications of the natural habitats on the biology of lizards.

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